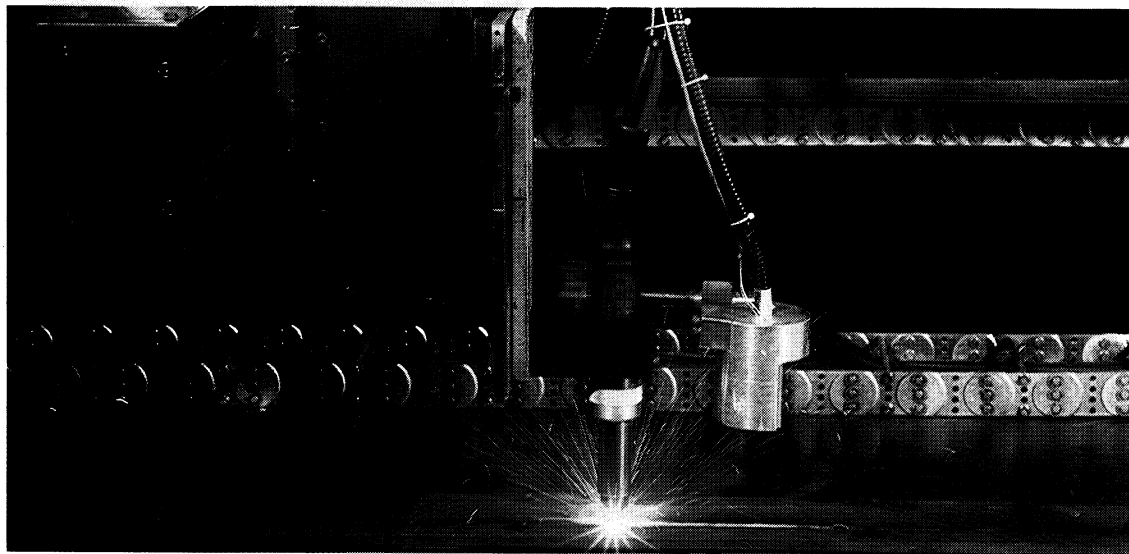
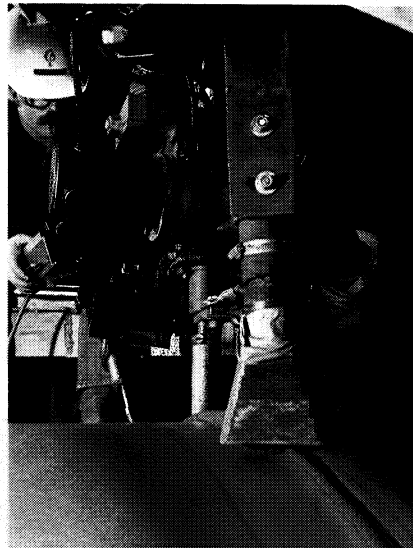


Automatic Welding System

Industrial firms have long been interested in robotic welding, which potentially offers higher productivity at lower cost than manual welding. A roadblock to broad commercial use has been lack of an effective guidance system—a means of guiding an arc welding torch along a seam without human intervention. There are some systems with automated arc guidance available, but they have disadvantages, such as limitations on types of materials or types of seams that can be welded; susceptibility to stray electrical signals; restricted field of view; or a tendency to contaminate the weld seam. Seeking to overcome these disadvantages and provide an effective system for automatic welding of space vehicle components, Marshall Space Flight Center, with the help of Hayes International Corporation, Huntsville, Alabama, developed a system that employs closed-circuit TV signals for automatic guidance of the welding torch.



NASA granted a license for commercial application of the technology to Combined Technologies, Inc. (CTI), Nashville, Tennessee, which developed a refined and improved arc guidance system based on the NASA work. CTI, in turn, licensed The Merrick Corporation, also of Nashville, for marketing and manufacturing of the new system, which is called the CT² Optical Tracker. The first purchaser of the device is Thompson Pipe & Steel Company, Denver, Colorado.

At upper right, a Thompson Pipe and Steel employee operating the manual seam tracker the company normally uses for welding large pipes, such as the 43½-inch-diameter pipe shown at right. The center photo shows a demonstration of the completely automated CT², whose principal elements are the TV camera and a microprocessor. The video unit views the area to be welded immediately ahead of the weld torch, and the pre-programmed computer automatically corrects the position of the torch if it is not precisely aligned with the weld joint. The CT² is a "non-contacting" system, meaning that its sensor follows a weld joint without touching its surface; this offers adaptability to a broader range of welding jobs and provides greater reliability in high speed operations. The CT² can be used with any weld process, it is extremely accurate, and it can travel at a high speed—up to 150 inches per minute.

